Overview

Useful For
Aiding in the diagnosis of thyroid autoimmune disorders
Differentiating thyroid autoimmune disorders from nonautoimmune goiter or hypothyroidism
As a diagnostic tool in deciding whether to treat a patient who has subclinical hypothyroidism

Testing Algorithm
See Thyroid Function Ordering Algorithm in Special Instructions.

Special Instructions

Method Name
Chemiluminometric Immunoassay

NY State Available
Yes

Specimen

Specimen Type
Serum Red

Specimen Required

Patient Preparation: For 12 hours before this test do not take multivitamins or dietary supplements containing biotin (vitamin B7), which is commonly found in hair, skin, and nail supplements and multivitamins.

Container/Tube: Red top

Specimen Volume: 0.6 mL

Collection Instructions: Red-top tubes should be centrifuged and aliquoted within 2 hours of collection.

Forms
If not ordering electronically, complete, print, and send a General Request (T239) with the specimen.

Specimen Minimum Volume
0.5 mL

Reject Due To

<table>
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<th>Rejection Type</th>
<th>Acceptance Status</th>
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<tr>
<td>Hemolysis</td>
<td>Mild OK; Gross reject</td>
</tr>
<tr>
<td>Lipemia</td>
<td>Mild OK; Gross OK</td>
</tr>
<tr>
<td>Icterus</td>
<td>NA</td>
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<tr>
<td>Other</td>
<td>Serum gel or plasma</td>
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Specimen Stability Information

<table>
<thead>
<tr>
<th>Specimen Type</th>
<th>Temperature</th>
<th>Time</th>
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<tbody>
<tr>
<td>Serum Red</td>
<td>Refrigerated (preferred)</td>
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<tr>
<td></td>
<td>Frozen</td>
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Clinical and Interpretive

Clinical Information

Thyroperoxidase (TPO) is an enzyme involved in thyroid hormone synthesis, catalyzing the oxidation of iodide on tyrosine residues in thyroglobulin for the synthesis of triiodothyronine and thyroxine (tetraiodothyronine). TPO is a membrane-associated hemoglycoprotein expressed only in thyrocytes and is one of the most important thyroid gland antigens.

Disorders of the thyroid gland are frequently caused by autoimmune mechanisms with the production of autoantibodies. Anti-TPO antibodies activate complement and are thought to be significantly involved in thyroid dysfunction and the pathogenesis of hypothyroidism.

The determination of TPO antibody levels is the most sensitive test for detecting autoimmune thyroid disease (eg, Hashimoto thyroiditis, idiopathic myxedema, and Graves disease) and detectable concentrations of anti-TPO antibodies are observed in most patients with these disorders. The highest TPO antibody levels are observed in patients suffering from Hashimoto thyroiditis. In this disease, the prevalence of TPO antibodies is about 90% of cases, confirming the autoimmune origin of the disease. These autoantibodies also frequently occur (60%–80%) in the course of Graves disease.

In patients with subclinical hypothyroidism, the presence of TPO antibodies is associated with an increased risk of developing overt hypothyroidism. Many clinical endocrinologists use the TPO antibody test as a diagnostic tool in deciding whether to treat a patient with subclinical hypothyroidism, and Mayo Clinic Laboratories endorses this practice.

See Thyroid Function Ordering Algorithm in Special Instructions.

Reference Values

<9.0 IU/mL

Reference values apply to all ages.

Interpretation

Values above 9.0 IU/mL generally are associated with autoimmune thyroiditis, but elevations are also seen in other autoimmune diseases.

In patients with subclinical hypothyroidism, the presence of thyroperoxidase (TPO) antibodies predicts a higher risk of developing overt hypothyroidism, 4.3% per year versus 2.1% per year in antibody-negative individuals. Furthermore, it raises the concern that such patients may be at increased risk of developing other autoimmune diseases, such as adrenal insufficiency and type 1 diabetes.

The frequency of detectable anti-TPO observed in nonimmune thyroid disease is similar to the 10% to 12% observed...
in a healthy population with normal thyroid function.

There is a good association between the presence of autoantibodies against TPO and histological thyroiditis. However, in view of the extensive regenerative capacity of the thyroid under the influence of thyroid-stimulating hormone, chronic thyroid disease may be present for years before the clinical manifestation of hypothyroidism becomes evident, if ever.

**Cautions**

Moderately increased levels of thyroperoxidase (TPO) antibodies may be found in patients with nonthyroid autoimmune disease such as pernicious anemia, type I diabetes, or other disorders that activate the immune system.

Some patients who have been exposed to animal antigens, either in the environment or as part of treatment or imaging procedure, may have circulating anti-animal antibodies present. These antibodies may interfere with the assay reagents to produce unreliable results.

**Clinical Reference**


**Performance**

**Method Description**

The Access (BeckmanCoulter DXI 800) thyroperoxidase (TPO) antibody assay is a sequential 2-step immunoenzymatic (sandwich) assay. A sample is added to a reaction vessel with paramagnetic particles coated with thyroperoxidase protein. The serum or plasma TPO antibody binds to the thyroperoxidase. After incubation in a reaction vessel, materials bound to the solid phase are held in a magnetic field while unbound materials are washed away. Protein A-alkaline phosphatase conjugate is added and binds to the TPO antibody. After the second incubation, materials bound to the solid phase are held in a magnetic field while unbound materials are washed away. The chemiluminescent substrate Lumi-Phos 530 is added to the vessel and light generated by the reaction is measured with a luminometer. The light production is directly proportional to the concentration of TPO antibody in the sample. The amount of analyte in the sample is determined from a stored, multipoint calibration curve. The analyte in the calibrator is traceable to international standard WHO 66/387.(Instruction manual: Beckman Coulter Assay, Beckman Coulter Inc., Fullerton, CA 2009)

**PDF Report**

No

**Day(s) and Time(s) Test Performed**

Monday through Friday; 6 a.m.-12 a.m.

Saturday; 6 a.m.-6 p.m.

**Analytic Time**

1 day

**Maximum Laboratory Time**

3 days
Specimen Retention Time

3 months

Performing Laboratory Location

Rochester

Fees and Codes

Fees

- Authorized users can sign in to Test Prices for detailed fee information.
- Clients without access to Test Prices can contact Customer Service 24 hours a day, seven days a week.
- Prospective clients should contact their Regional Manager. For assistance, contact Customer Service.

Test Classification

This test has been cleared or approved by the U.S. Food and Drug Administration and is used per manufacturer's instructions. Performance characteristics were verified by Mayo Clinic in a manner consistent with CLIA requirements.

CPT Code Information

86376

LOINC® Information

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<th>Test ID</th>
<th>Test Order Name</th>
<th>Order LOINC Value</th>
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<td>TPO</td>
<td>Thyroperoxidase Ab, S</td>
<td>8099-4</td>
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